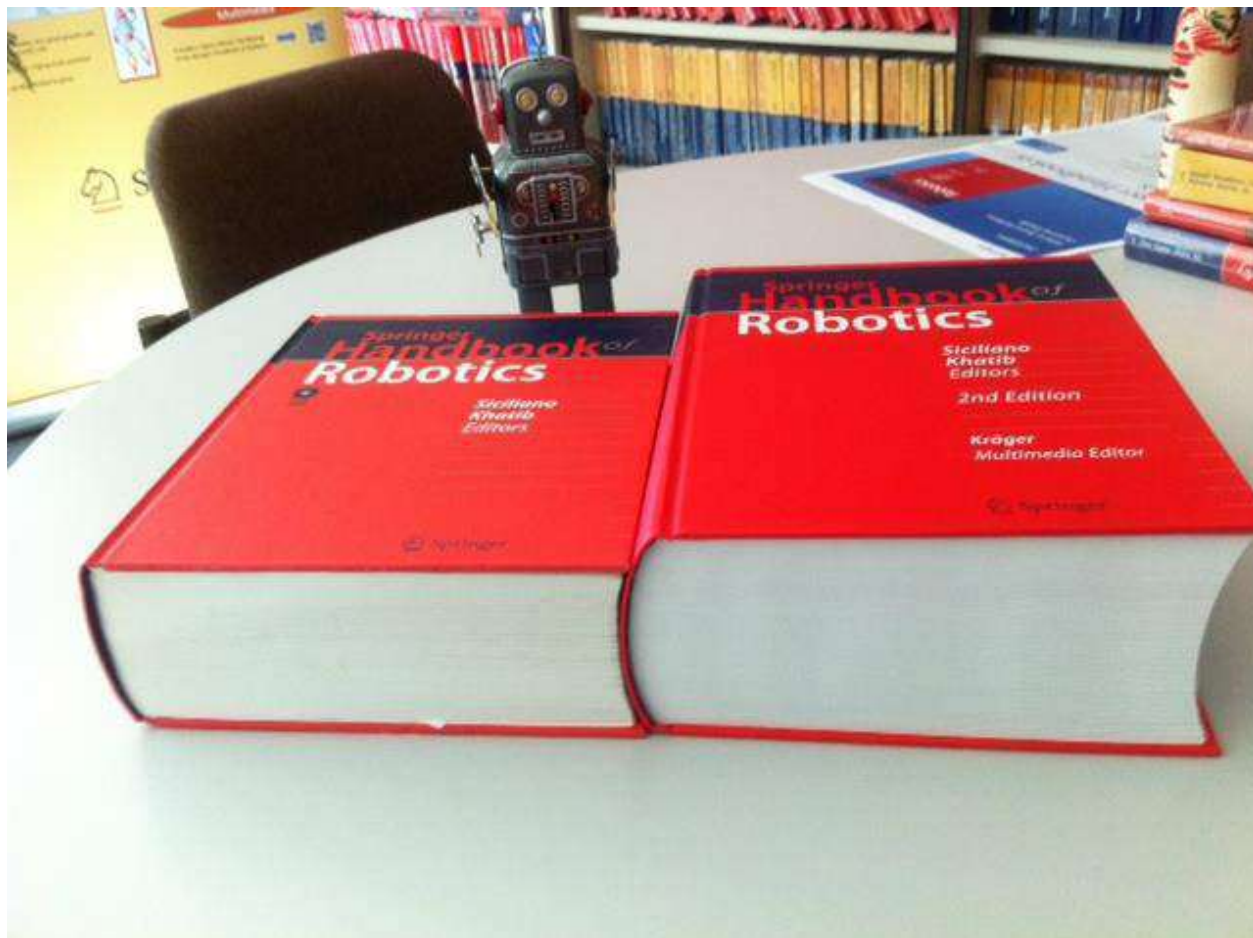




**TAL
TECH**

SISSEJUHATUS ERIALASSE: ROBOOTIKA

Maarja Kruusmaa, Biorobootika Keskus

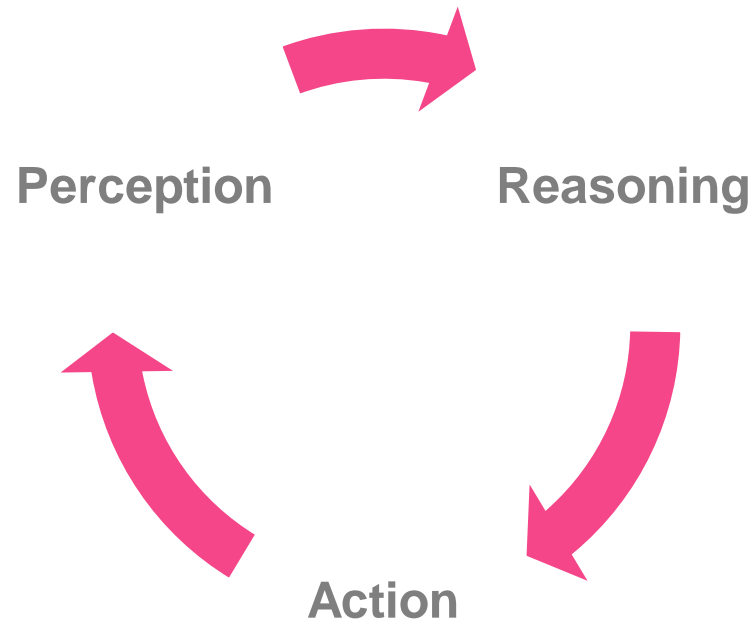


IAS0220 Robotite
juhtimine ja tarkvara
(baka 3 aasta
sügisel)

IAS0060 Robootika
(magistriõppes)

WHAT IS A ROBOT?

- IEEE Robotics and Automation Society definition: *A robot is an autonomous machine capable of **sensing** its environment, carrying out computations to **make decisions**, and **performing actions** in the real world.*





Industrial robots. Preprogrammed, have no feedback from the environment



Teleoperated robots



Service robots. Have sensors and react to signals from the environment

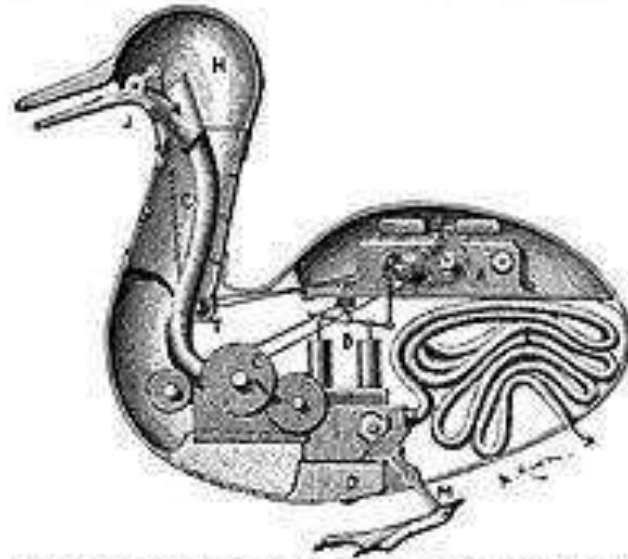


Intelligent robots. Perceive and understand complicated environments, learn and adjust, make independent decision.

Degree of Autonomy

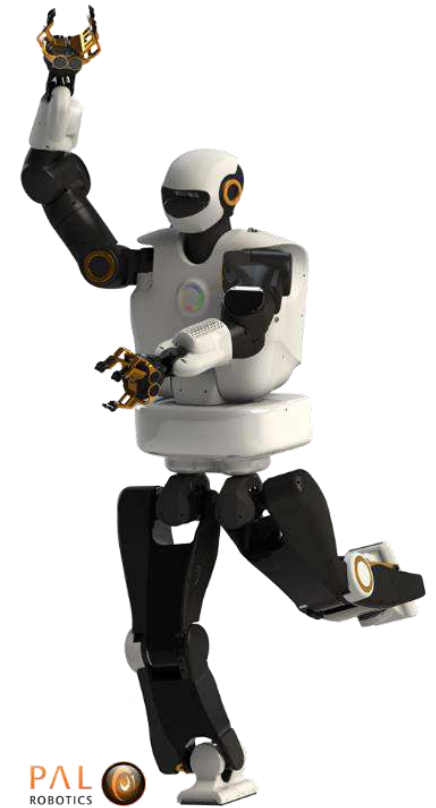
Environmental Complexity

ROBOTITE AJALUGU: VAUCANSONI MEHAANILINE PART (1738)



INTERIOR OF VAUCANSON'S AUTOMATIC DUCK.
A, clockwork; B, pump; C, mill for grinding grain; F, intestinal tube;
J, bill; H, head; M, feet.

ROBOTITE TÜÜBID



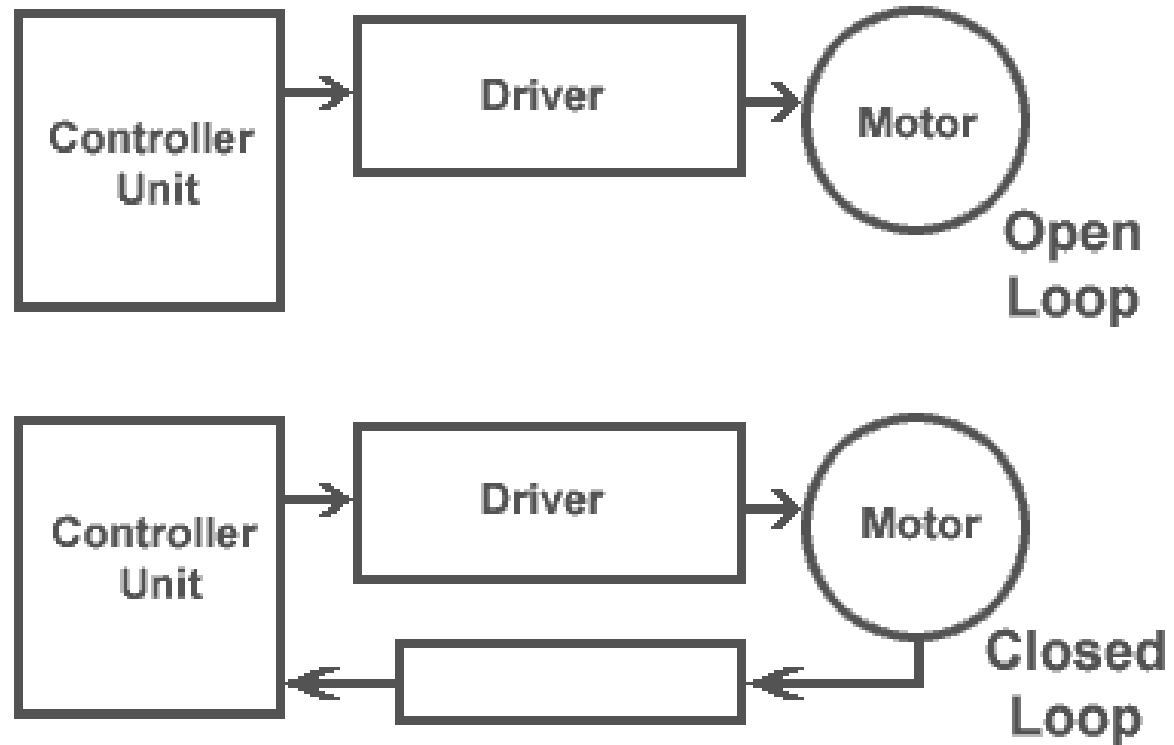
TÖÖSTUSROBOTID



**TAL
TECH**

TALLINNA

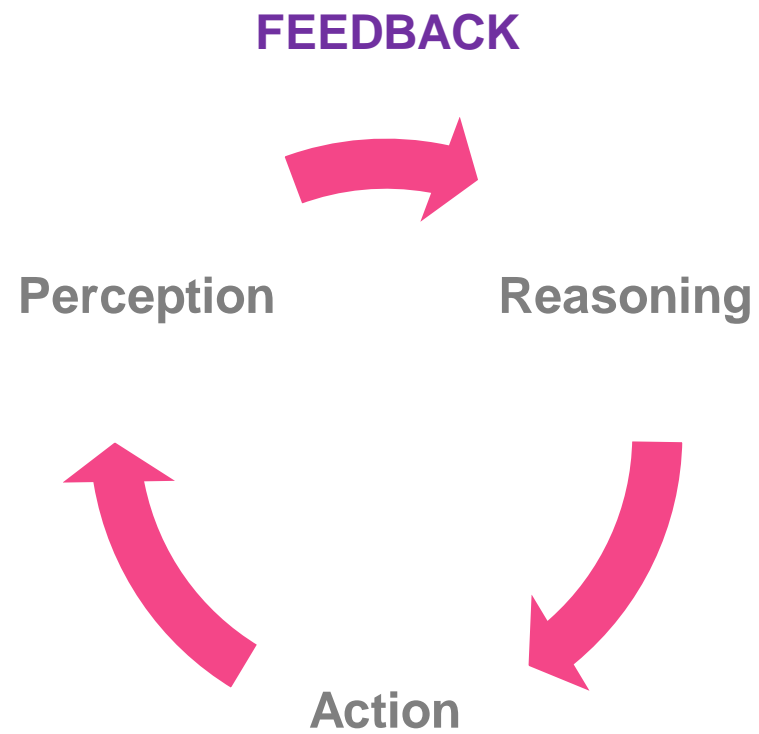
TAGASISIDEGA JUHTIMINE

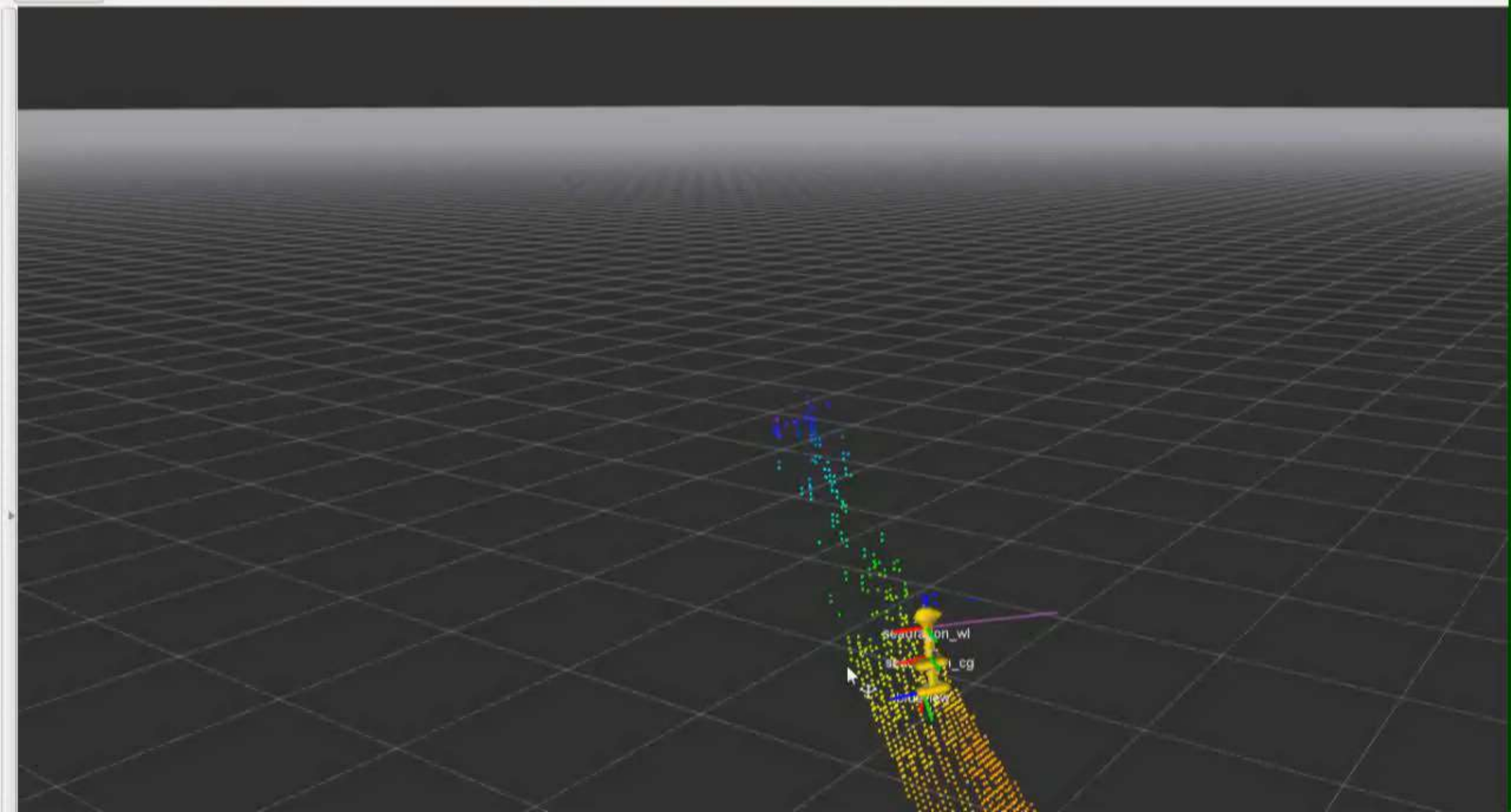


Feedback Control

© www.robotplatform.com

WHAT IS A ROBOT?

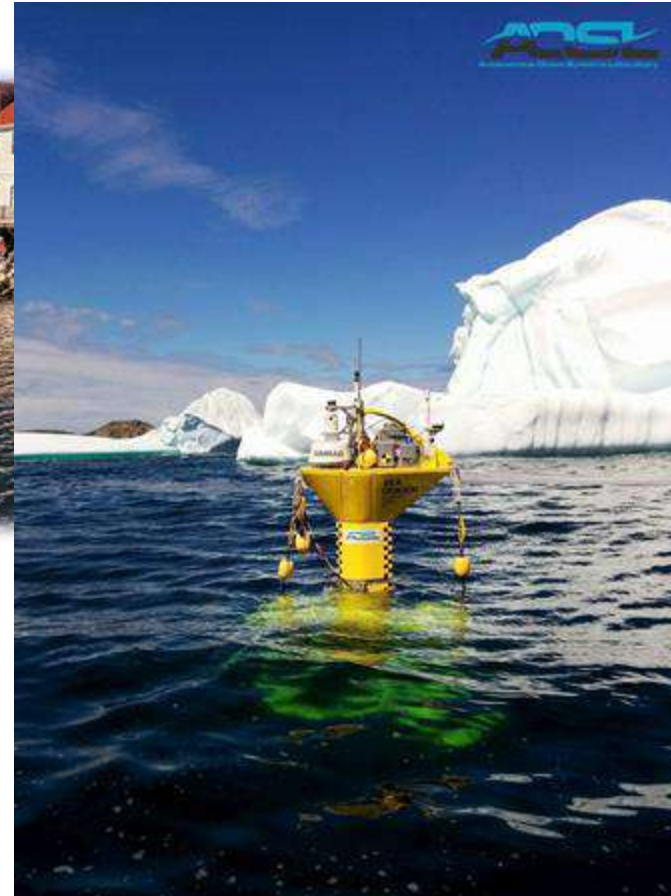




USV SEADRAGON – FIELDTRIALS



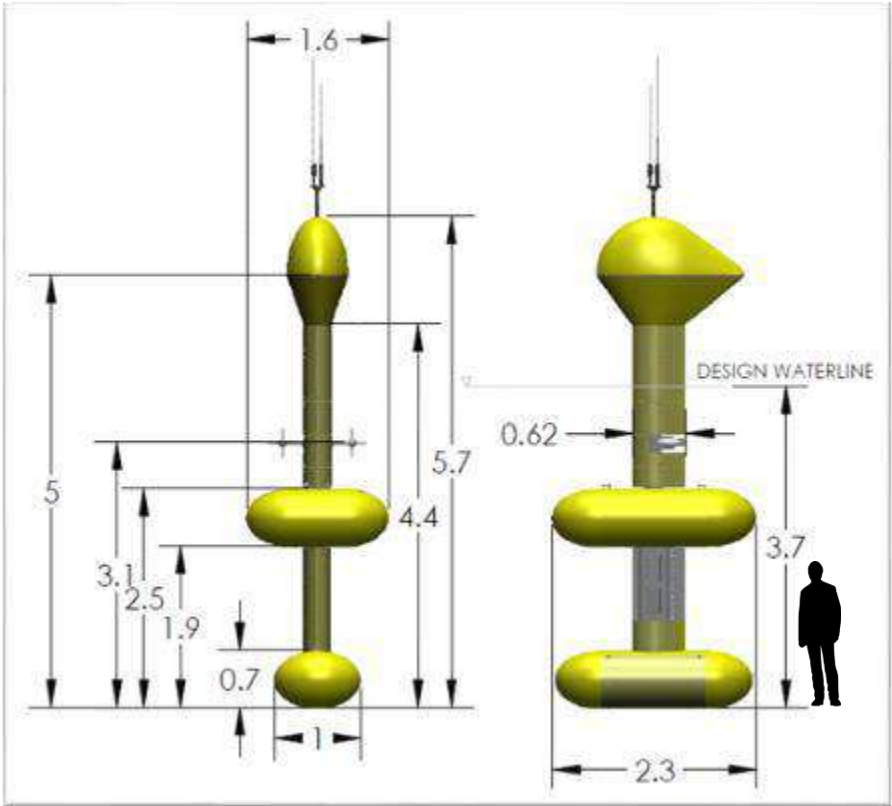
November 2015 - April 2016
Holyrood Marine Base, Conception Bay, NL,
Canada



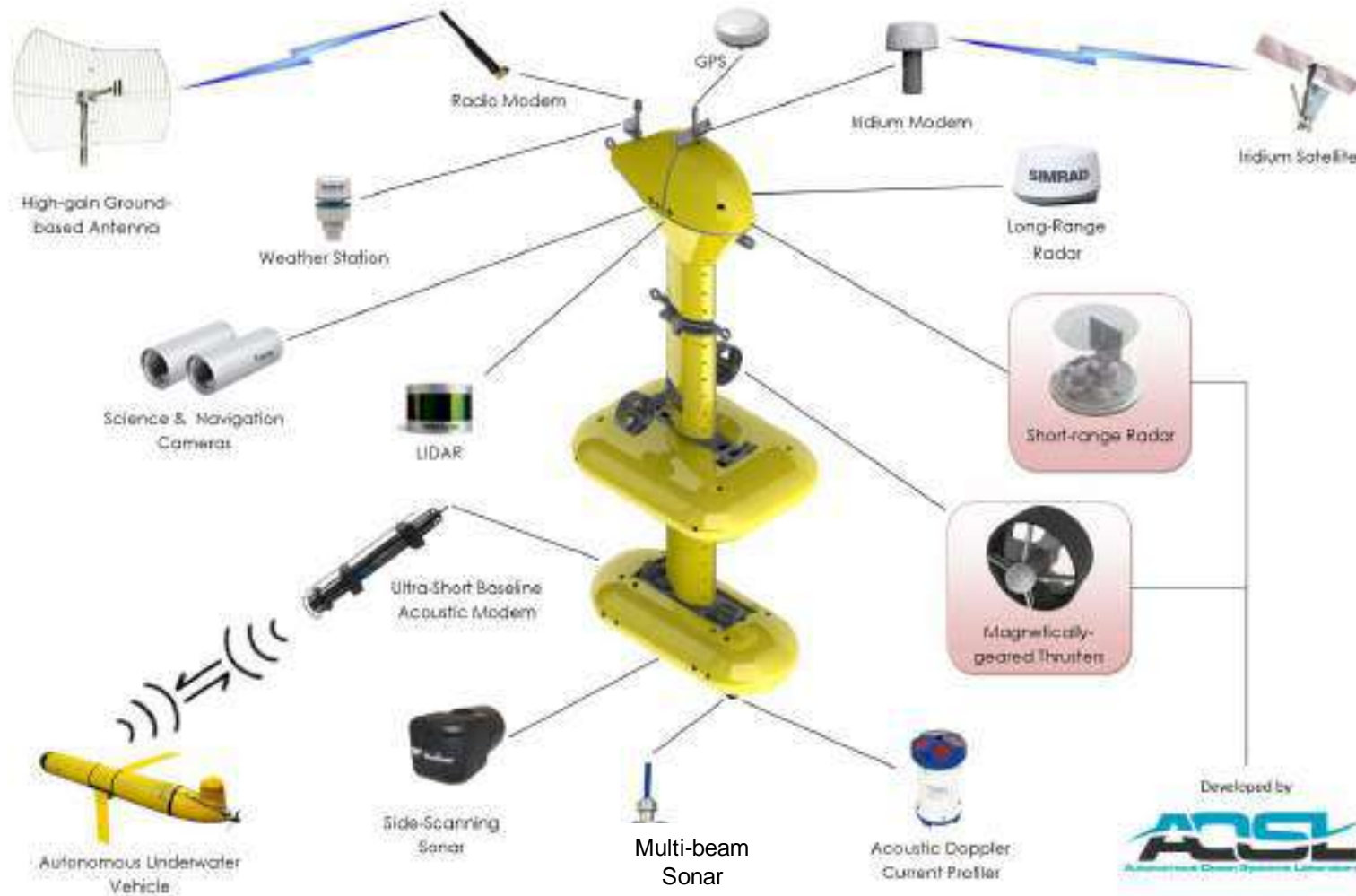
June 2016
Twillingate, NL, Canada

USC – SEADRAGON

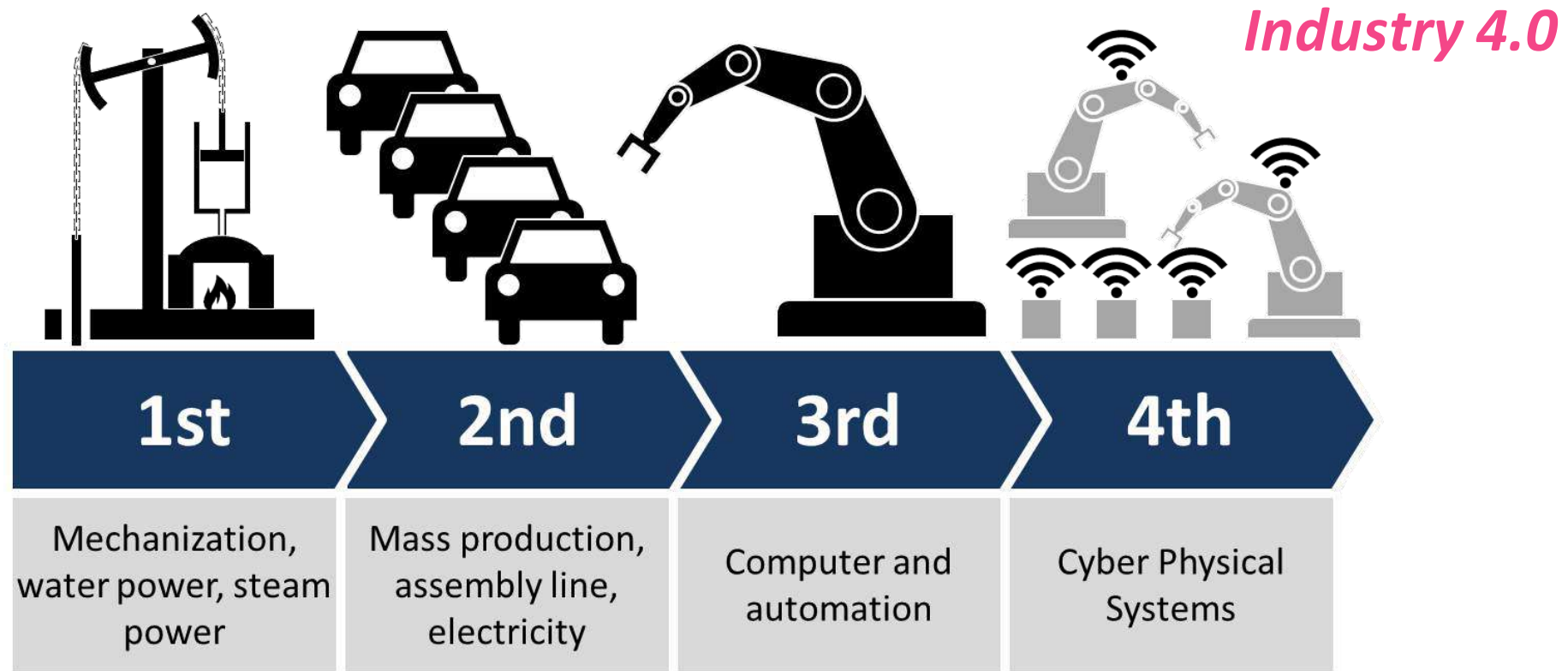
Parameter	Value	Units
Maximum Length	2.3	m
Waterline Length	0.62	m
Maximum Beam	1.6	m
Waterline Beam	0.3	m
Height (keel to antenna mast)	7.3	m
Freeboard	1.5	m
Draft	3.7	m
Displacement	840	kg
Waterplane Area	0.070	m ²
Internal Payload Capacity (payload/energy storage)	0.203/0.1 20	m ³
Payload Capacity	120	kg



INTEGRATED SYSTEM-SENSOR AND ACTUATORS



TRENDID TÖÖSTUSROBOOTIKAS



TRENDID TÖÖSTUSROBOOTIKAS



TRANSIPORDIROBOTID



PÕLLUMAJANDUSROBOTID



MEDITSIINIROBOTID



MEDITSIINIROBOTID



**TAL
TECH**

TALLINNA TEHNIKAÜLIKOOL



TEENINDUSSROBOTID



TRANSPORDIROBOTID



TRANSPORDIROBOTID

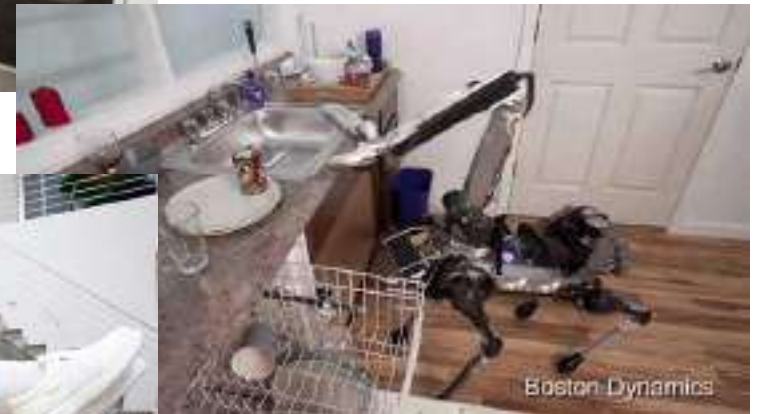


MEELELAHUTUS

<https://youtu.be/txXwg712zw4?t=25s>



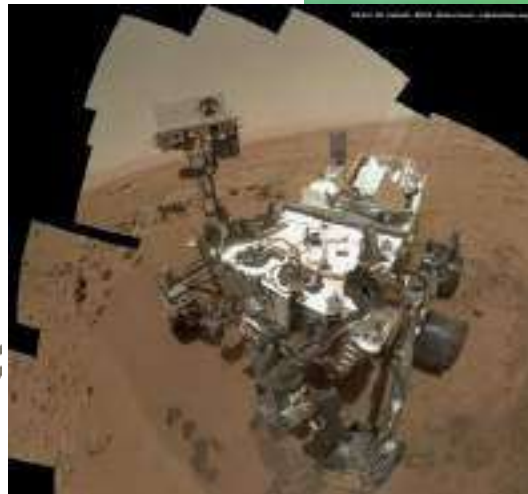
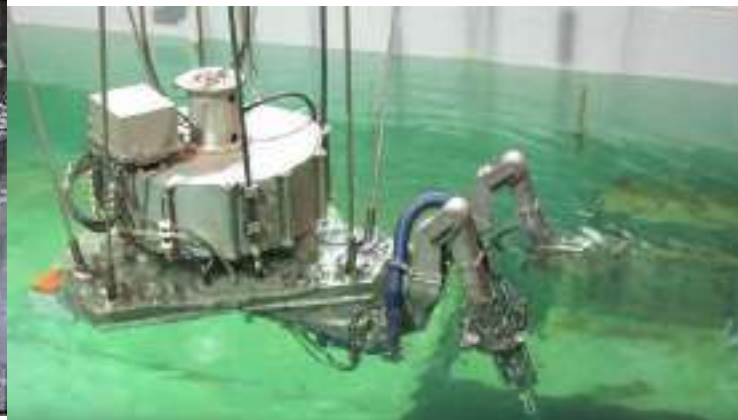
KODUROBOTID



MILITAARROBOTID



ROBOTID OHTLIKES KESKKONDADES



CHALLENGES OF CLOSE AND SHALLOW

ice



vegetation



rapids



waves



mud



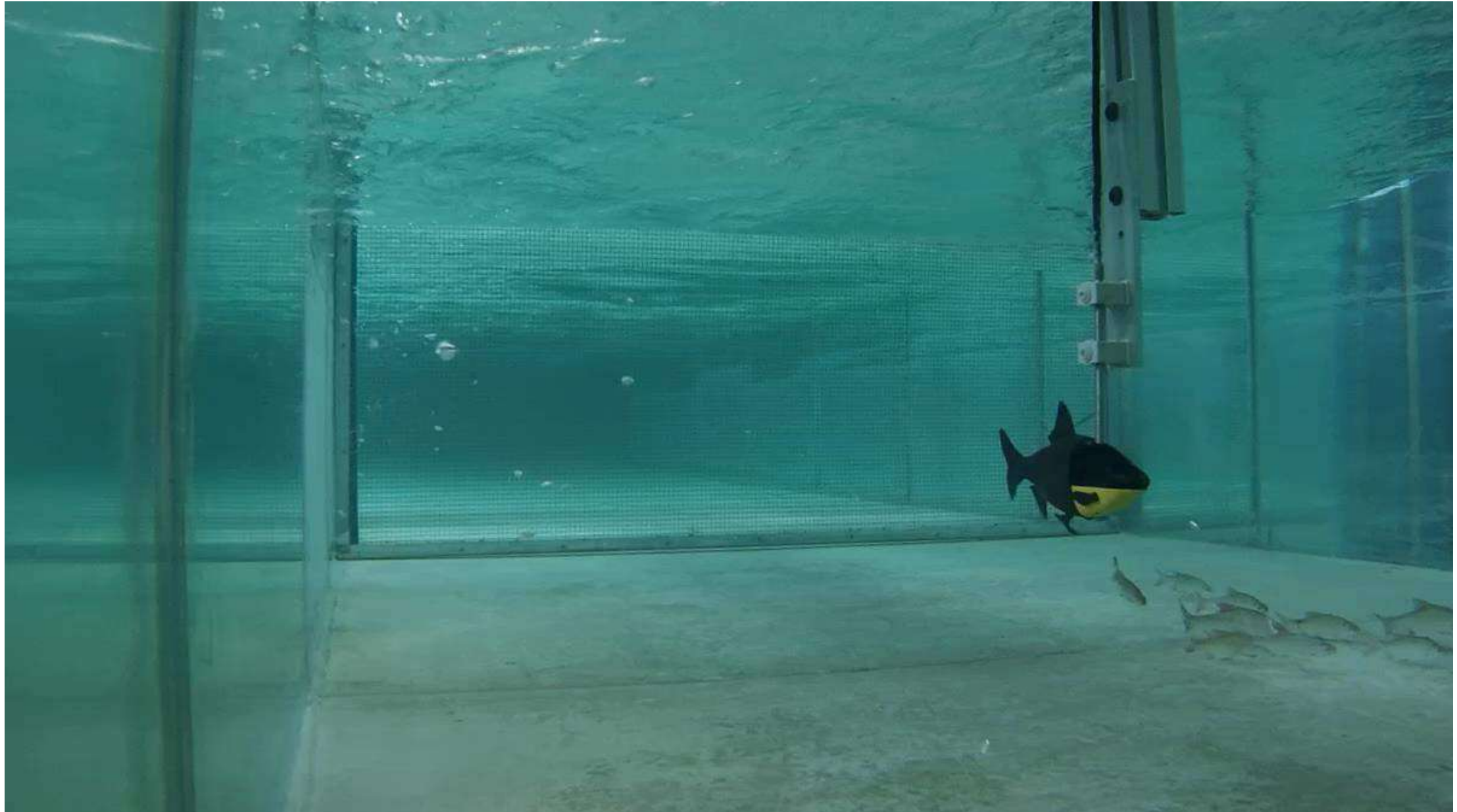
confined spaces

TALTECH BIOROBOOTIKA KESKUS: ROBOTID VEEALUSTES NING OHTLIKES KESKKONDADES

- Autonomous mining robot (A,B,C,E)
- Underwater navigation using pressure and inertial sensors (B,E)
- Automated feature detection in harsh, GPS-denied environments (B,C,E)
- Variable stiffness actuators with embedded sensing (A,B,E)



HYDROELECTRICITY – DOWNSTREAM MIGRATION







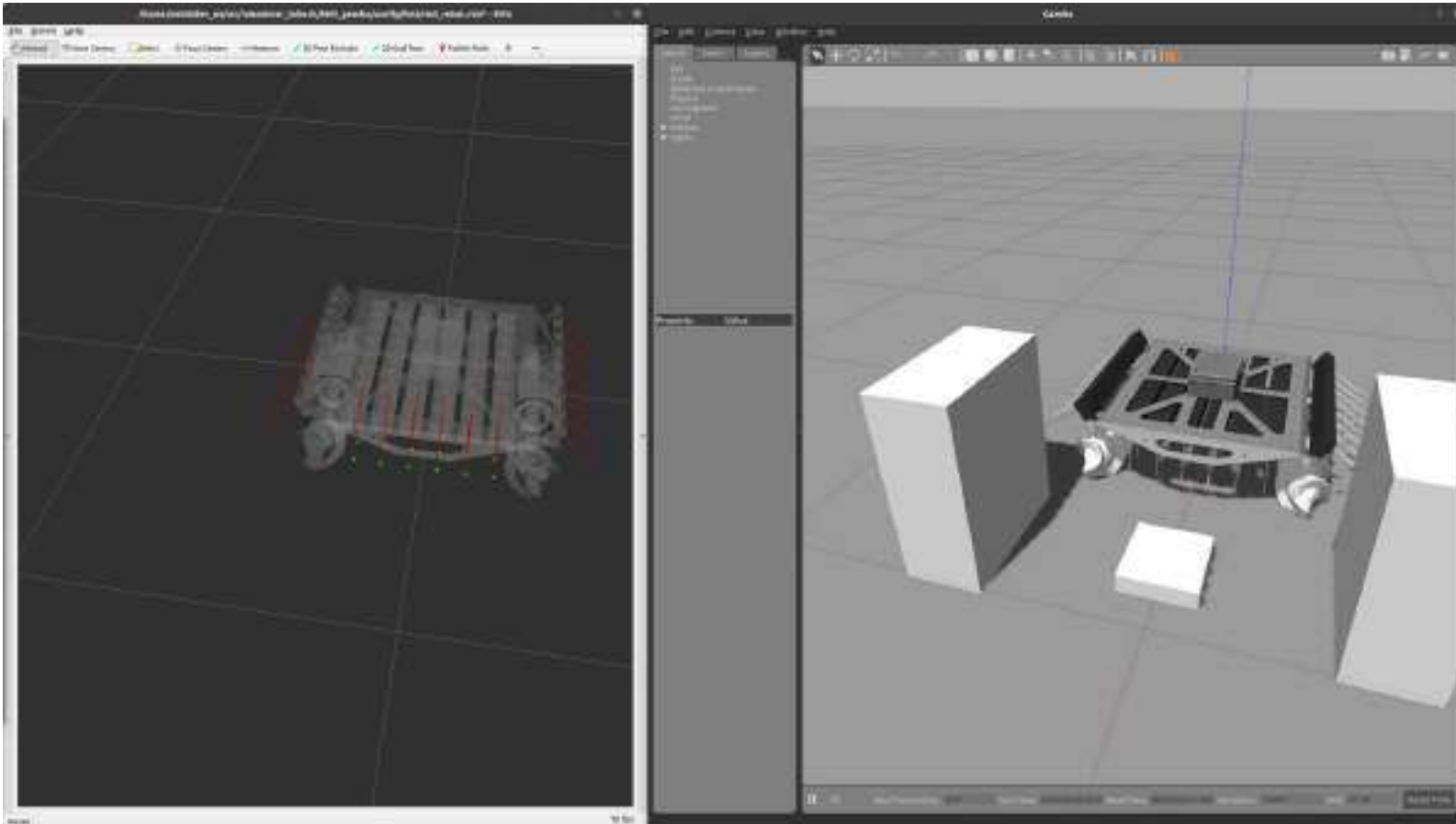


GETTING OUT OF WATER

The logo for Robominers features a red hexagonal icon on the left, composed of several interlocking geometric shapes. To the right of the icon, the word "ROBOMINERS" is written in a bold, white, sans-serif font. A red horizontal line with a dashed pattern runs through the middle of the letters, passing through the hexagonal icon.

MID-RANGE SENSORS - TACTILE SLAM

- Tactile perception for simultaneous localization and mapping (SLAM) in limited visibility





GETTING OUT OF WATER



TAL TECH

**SELLEL KURSUSEL ON OSALISELT KASUTATUD KARL KRUUSAMÄE
LOENGUMATERJALE**

